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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/067,208 04/28/98 HOWARD

W P-7860

EXAMINER

IM52/1029

GIRMA WOLDE-MICHAEL
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MINNEAPOLIS MN 55432

GREBEAU, J
ART UNIT PAPER NUMBER

1745
DATE MAILED:

10/29/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.

09/067,208

Applicant(s)

HOWARD, WILLIAM G.

Examiner

Jonathan S. Crepeau

Art Unit

1745

-- The MAILING DATE of this communication appears on the cover sheet with the correspond nce address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 October 2001.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8, 10-17, 28-35, 37-44, 46-53, 55-62 and 92-101 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8, 10-17, 28-35, 37-44, 46-53, 55-62 and 92-101 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

DETAILED ACTION

Response to Amendment

1. This Office action addresses claims 1-8, 10-17, 28-35, 37-44, 46-53, 55-62, and 92-101. Claims 1, 3-8, 10, 12-17, and 95-97, which are entitled to the filing date of the parent '760 patent, are newly rejected under the doctrine of obviousness-type double patenting over the '760 patent. The §102(b) rejection of these claims over the '760 patent was determined to be erroneous and has been withdrawn. However, these claims have been newly rejected under 35 USC §103. Claims 2, 11, 28-35, 37-44, 46-53, 55-62, 92-94, and 98-101 remain rejected under 35 USC §103 over Takeuchi et al. in view of Howard et al. Additionally, claim 62 is newly rejected under 35 USC 112, first paragraph. As various new grounds of rejection have been introduced, prosecution is reopened and this action is not made final.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claim 62 is rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Claim 62 recites that the alkali metal strip has a height which is shorter than

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the height of the cathode current collector. The application as originally filed (e.g., page 12 of specification and original claim 28) supports a recitation of the *anode current collector* being shorter than the cathode current collector, but a recitation of the *alkali metal strip* being shorter than the cathode current collector does not appear to be contemplated or envisioned by the originally filed application. Accordingly, this recitation is considered to constitute new matter.

Double Patenting

4. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

5. Claims 1, 3-8, 10, 12-17, and 95-97 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-71 of U.S. Patent No. 5,439,760 (Howard et al). Although the conflicting claims are not identical, they are not patentably distinct from each other because while the claims of the '760 patent do not use the term "end segment," they recite "outermost layers" which in fact correspond to the end segments of the instant claims. The claims of the '760 patent also recite the other features of the instant claims, namely the pouch-type separators, current collector materials, and cathode materials.

Claim Rejections - 35 USC § 103

6. Claims 1, 3, 10, 12, and 95-97 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schmode (U.S. Patent 5,008,165) in view of Crabtree (4,539,271).

In Figures 2-7, Schmode teaches an electrochemical cell comprising a wound electrode assembly (7) comprising elongated anode (11) and cathode (9) assemblies. As taught in the abstract, the outermost layer of the coil comprises an end segment of the anode assembly. As shown in Figures 3 and 4, the anode assembly comprises an anode current collector (12) having a tab extending from an edge thereof and a strip of alkali metal (8') disposed thereon. The cathode assembly comprises a cathode current collector (13) having a tab extending from an edge thereof and a cathode material (9) bonded thereto. As taught in column 6, line 11, the anode current collector can be made of copper. The cathode current collector has a shorter length than the strip of alkali metal (8').

Schmode does not expressly teach the presence of pouch-type separators individually surrounding the anode and cathode assemblies.

The patent of Crabtree is generally directed to wound lithium electrochemical cells having a pouch-type separator enclosing each electrode assembly, as shown in the Figures.

Therefore, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made because Crabtree provides sufficient motivation for an artisan to use her separator configuration in the cell of Schmode. In column 3, line 67-column 4, line 17, Crabtree teaches that her configuration provides for a method of manufacture which is readily adaptable to high speed automated techniques by eliminating the need for hand mating of the electrodes. Additionally, Crabtree teaches the separators are less likely to be torn after

insertion into the electrochemical cell. Accordingly, the artisan would have sufficient motivation to use this separator configuration in the cell of Schmode.

Regarding the process limitations recited in instant claims 95 and 96, the courts have generally held that process limitations in product/apparatus claims do not need to be accorded patentable weight because they do not limit the structure of the claimed product. Accordingly, these limitations are not considered to distinguish over the references.

7. Claims 4-8 and 13-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schmode in view of Crabtree as applied to claims 1, 3, 10, 12, and 95-97 above, and further in view of Keister et al (U.S. Patent 4,830,940).

Schmode does not expressly teach that the cathode current collector is formed of titanium or that the cathode mix comprises a silver vanadium oxide cathode active material, a PTFE binder, or a carbon conductivity enhancer.

In column 8, lines 34-41, Keister et al. teach lithium battery having a cathode mix comprising a silver vanadium oxide cathode active material, a PTFE binder, and a carbon conductivity enhancer. Keister et al. further teach in column 4, lines 40-43 that the cathode current collector may be formed of titanium.

Therefore, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made because the artisan would possess sufficient motivation to use these materials in the cell of Schmode. In the abstract, Keister et al. state that the use of the silver vanadium oxide provides their cell with high volumetric capacity and high

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rate capability, among other advantages. Accordingly, and artisan would be sufficiently motivated to use the materials of the cathode assembly of Keister et al. in the cathode assembly of Schmode.

8. Claims 2, 11, 28-35, 37-44, 46-53, 55-62, 92-94, and 98-101 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takeuchi et al (U.S. Pat. 5,549,717) in view of Howard et al.

In Figure 4 and in column 3, line 36-column 4, line 55, Takeuchi et al. teach an electrode assembly having two substantially straight sides and comprising spirally-wound anode and cathode assemblies. The anode assembly comprises a nickel current collector (68) and lithium strips (64, 66). A tab (72) extends from the edge of current collector 68. Current collector 68 has a smaller length and width than the length and width of lithium strip 66 (see col. 4, line 39). The cathode assembly comprises silver vanadium oxide active material (47) which is embedded into a titanium current collector (54). The current collector 54 comprises tabs (48, 50) extending from the edges. Takeuchi et al. incorporate by reference the disclosure of Keister et al (U.S. Pat. 4,830,940), which discloses that the cathode can comprise a mixture of silver vanadium oxide, PTFE binder, and graphite powder conductivity enhancer (col. 8, lines 37-42 of Keister et al). In column 4, line 26, Takeuchi et al. disclose that the separator surrounding the cathode assembly is sealed on all three open sides so that only the tabs project. In column 5, line 25, Takeuchi et al. disclose that alternatively, a separator may be folded around the anode assembly in a manner

similar to the cathode assembly. In Figures 7, 8, and 10 and in column 5, line 63 et seq., the reference discloses that the portion of the anode (80) around the periphery of the electrode assembly (i.e., the “end segment”) requires only one lithium strip.

Takeuchi et al. do not explicitly teach that the anode current collector forms the outermost layer of the electrode assembly, or that the cathode current collector is shorter than the lithium strip by an amount that enables the end segment of the anode assembly to be wound into the outermost layer. Takeuchi et al. also do not explicitly teach the exact length of the anode current collector as a percentage of the length of the lithium strip, or that separators cover both the cathode and anode assemblies simultaneously.

Howard et al. teach pocket-type separators covering spirally wound anode and cathode assemblies in column 3, lines 37-46. Additionally, Howard et al. teach in Figure 10 and in column 6, lines 53-65 that the length of the alkali metal strip (15) is longer than the length of the cathode current collector by an amount that enables the end segment of the anode assembly to be wound into the outermost layer.

Therefore, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made because the patent of Howard et al. shows that using separators simultaneously on the anode and cathode assemblies is well known in the art.

Although Takeuchi et al. in effect disclose that a separator is placed on either the anode *or* the cathode assembly, the artisan would understand that covering both electrode assemblies (as shown by Howard et al.) would be an advantageous modification of the battery of Takeuchi et al. because dendrite protection would be increased and delamination of both active material layers would be decreased. As stated in Howard et al. at column 3, line 40, “[t]he separator pouch then

prevents the transport of stray material in the cell which could cause a short circuit and the double thickness of the separator between anode and cathode elements better resists damage during the winding process". The separators are made by a folding and sealing method (col. 5, lines 33-68 of Howard et al.). Additionally, although Takeuchi et al. do not explicitly teach that tab(s) project through slits in the separators, this configuration is also clearly shown in Howard et al. and is considered to be obvious to the skilled artisan.

Furthermore, the disclosure of Takeuchi et al. provides sufficient guidance for the artisan to ascertain that the anode current collector forms the outer layer (winding) of the electrode assembly. As stated above, the reference discloses that the portion of the anode around the periphery of the electrode assembly requires only one lithium strip. From this disclosure, the artisan would be able to ascertain that the one lithium strip would be present on the inside portion of the anode current collector, in order to make contact with a corresponding cathode active material layer. Accordingly, it would be well within the skill of the art to ascertain that the anode current collector would form the outer layer of the electrode assembly. Additionally, it is noted that the Howard et al. reference is also concerned with the having the anode current collector in the outermost layer of the cell. Therefore, the way that Howard et al. achieve this configuration (by making the cathode current collector shorter than the lithium strip, as set forth above) is deemed to be an obvious way of achieving this same configuration in the battery of Takeuchi et al.

Finally, the length of the current collector is a parameter which may be optimized by the artisan to achieve a particular result, i.e., the utilization rate of active material, current density, etc. It has been held that when the general conditions of a claim are disclosed in the prior art, it

is not inventive to discover the optimum or workable ranges by routine experimentation (*In re Aller, Lacey, and Hall*, 105 USPQ 233).

Response to Arguments

Applicant's arguments filed October 9, 2001 have been fully considered but they are not persuasive. Applicants assert that the '760 patent (Howard et al.) supports the instantly claimed limitation that the anode current collector is shorter in length than the alkali metal strip. However, as stated by the Examiner in the previous Office action, the '760 patent in fact teaches that the *cathode*, not anode, current collector is shorter in length than the alkali metal strip (see Figure 10; col. 6, lines 53-65 of '760). Accordingly, since the instant claims are not directed to subject matter *solely* disclosed in the parent '760 application, the claims are only entitled to the filing date of the instant application. Therefore, the use of the Takeuchi patent is deemed to be proper, since the filing date of the instant application is antedated by the Takeuchi patent. See also *In re Chu*, 36 USPQ2d 1089 (Fed. Cir. 1995); and MPEP §201.11. Furthermore, because the instant claims are not fully supported by the parent '760 patent, the patent qualifies as prior art under 35 USC §102(b) against the claims and is also available for use in a rejection as set forth above.

Conclusion


9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jonathan Crepeau whose telephone number is (703) 305-0051. The examiner can normally be reached Monday-Friday from 9:30 AM - 6:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gabrielle Brouillette, can be reached at (703) 308-0756. The phone number for the organization where this application or proceeding is assigned is (703) 305-5900. Additionally, documents may be faxed to (703) 305-3599.

Any inquiry of general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

JSC

October 26, 2001


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